

Urban Circulations

Conference report on the virtual conference of the
Research Training Group KRITIS, Technical University of Darmstadt

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Recent crises like Covid-19, transmitted across globally interconnected cities, raise questions about the nature of infrastructural circulation and its ambivalent effects in cities. On June 23rd, 2022, over 50 scientists came together for the virtual conference Urban Circulations organized by the Research Training Group KRITIS at the Technical University of Darmstadt. Circulations are a key function of networked technical infrastructures for mobility, transport, energy, and information, on which the group's research is focused. Despite its relevance for infrastructure research, *circulation* is mostly used as a descriptive term. Hence, the conference aimed at elaborating a more analytical understanding of circulations in and between cities mediated by infrastructures.

In her introduction, Eline Punt broadly defined *circulation* as “interconnected, multidirectional movement within possibly heterogeneous and evolving socio-technical and ecological systems”. Jens Ivo Engels, the group's speaker, then proposed a more narrow definition of *circulation* as movement along the grid structure determined by its capacities and the rules set by the providers. He then outlined specific dimensions of urban circulations, which include the high density and connectivity of infrastructures that ensure the provision of services, create conflict, and lead to cascading failures.

Following these introductory comments, the event featured a total of twelve contributions. Three panels were dedicated to “Working with circulation”, “Planning circulation”, and “Materialities of circulation”. They addressed desiderata in current infrastructure research, such as unveiling invisible relations and connections, rhythms and temporality, and disruption and storage. Beyond these rather conceptual approaches, many contributions highlighted social inequalities and struggles accompanying circulation, while the keynotes bracketing the conference also addressed the ways in which circulation is significant for the global environmental crisis in the long term.

Keynote 1: Metabolisms – symbolic, imaginary, and real

ERIK SWYNGEDOUW (Manchester) introduced the notion of *metabolism* as the circulatory transfiguration of matter, entailing recurrent destruction and creation. First conceptualized to explain the functioning of the blood cycle, *metabolism* and *circulation* were later applied by Karl Marx and others to socio-ecological processes in the city and economy, such as the delivery of infrastructural services. Swyngedouw showed how metabolic circulations, even though tightly connected to labor and flows of money and structured by social relations, had mostly been reduced to techno-managerial problems of input-output relations throughout the 20th century. Drawing on a conception of Jacques Lacan, Swyngedouw differentiated between the *symbolic*, *imaginary*, and *real* dimensions of metabolisms, using the example of the electric vehicle: Symbolically presented as a solution to the climate crisis, it evokes images of a sustainable and equal future while sustaining economic growth. This imaginary is concealing the real, i.e., uneven power relations between classes and world regions, and alarming global trends in consumption of non-renewable resources and CO2 emissions.

¹ The authors of this report were also the organizers of the conference.

Swyngedouw ended by emphasizing the role of political ecology to unveil who benefits and who suffers from these processes and identify strategies toward socio-ecological equality.

Panel 1: Working with circulation

MATHIAS DENECKE (Bochum) reflected on the notion of circulation as a broad and sometimes generalizing notion describing flows and movement, sometimes concealing differences between types of circulation, their production by *circulation workers*, and their political conditions. Drawing on critical logistics research focusing on Amazon fulfillment centers and reports by food delivery workers, Denecke investigated how circulation is generated by workers processing, moving, and delivering goods. Often these workers are low-paid, precariously employed, faced with various, partly technical control measures, and with little time and few places to organize. In addition to this hard work, apparently smooth flows require recurrent standstill to synchronize circulatory rhythms within the supply chain. Denecke highlighted the need to become more aware of these differentiated processes generating circulation, the role of circulation workers, and our own complicity in their exploitation.

NICOLÁS PALACIOS CRISÓTOMO (Zurich) presented his research on fast grocery delivery platforms and workers' resistance tactics in Barcelona and Berlin. Palacios illustrated the fast growth of the delivery companies Gorillas in Berlin from 2020 and the slower-growing Glovo from 2015 in Barcelona, fostered by venture capital investments, and their subsequent shrinkage in 2022. In both cities, workers had been striking to protest bad work conditions, exploitative structures, or reluctance to meet legal requirements. Drawing on Henri Lefebvre, Michel DeCerteau, and others, Palacios portrayed the *strategies* employed by the companies for value capture and the resistance *tactics* of workers. For instance, companies relied on the optimization of routes, Taylorist digital control of workers, and territorialization through delivery areas or dark stores. Workers used these outcomes of territorialization, e.g., by organizing and striking in warehouses to interrupt the supply chain. Palacios concluded that the platforms appeared as ephemeral technological fixes for capital investment during the pandemic and that the new frontiers of investment were still unclear.

KRISCHAN BOCKHORST (Leipzig) focused on the delivery of packages across the Iron Curtain from West Germany to Poland from 1980 to 1989. He explained how the flow of post packages increased over that period, but deliveries took up to 4 months and costs were rising. In the early 1980s, limitations of the delivery by train were mitigated but not resolved after adding new delivery routes next to the central route from Hannover to Warsaw, since trains needed to wait to cross borders. Delays, damages, and thefts during delivery led to decreasing trust in the postal system. Bockhorst showed how these problems fostered the creation of new flows across the iron curtain, starting with the transport of medical supplies and other packages with trucks organized by charity organizations. From 1983, private companies became a rival to Deutsche Bundespost. Discussing his findings, Bockhorst argued that the Iron Curtain did not bar off flows entirely but opened some possibilities for cross-border exchange and delivery of goods.

CAROLIEN LUBBERHUIZEN (Utrecht) drew on her research on the daily commutes of migrant farm workers in the Dutch Westland and Haspengouw in Belgium, conceiving this commuting as a type of *arrival infrastructure*. Lubberhuizen showed how urban-rural or rural-rural commutes are accomplished by using buses run by labor agencies or shared cars to travel between the farms and urban centers or rural hotels owned by the agencies. According to their respective modes of transportation and accommodation, the workers are caught up in dependencies on the employment agencies, hotel managers, or farmers who control the transportation of workers, working hours, or

information available to the workers. At the same time, different kinds of support and other arrival infrastructures are available to the workers, which are more present in urban centers. Lubberhuizen concluded that the diverse urban-rural circulations of migrant workers are crucial for migrants' everyday experiences since they are connected to other arrival infrastructures and offer different degrees of agency, but also entail precarity.

Panel 2: Planning Circulations

Based on newspaper archives RODRIGO AGUEDA (Rio de Janeiro) presented how the construction of the Joá bridge, an infrastructural complex comprised of four tunnels and two-level bridges, served as a signpost of circulation for future-oriented urban development in Rio de Janeiro from the 1960s to the 1980s. The bridge was developed to create a new wealthy suburb, the Barra de Tijuca, and connect it to the Copacabana coast settlement. The Joá enabled the circulation of people, cars, water, and electricity to develop the new suburb. Agueda showed how infrastructures can facilitate the construction and circulation of ideas and *imaginaries* about social relations and future city expansions. At the same time, he made clear that imaginaries of these infrastructures often concealed that many people died during their construction and that they reproduced a “dual city” where segregation based on social position was prevalent.

MATTIAS MALK (Tallinn) discussed infrastructural renewal and structures of expectation in secondary cities. In the context of neoliberal economic growth modes, planners and policymakers in secondary cities covet new mobility infrastructures to catch up with the dynamics of circulating capital. Using the example of the Rail Baltica project in Pärnu, Malk revealed a persistent mismatch between expectations and actual developments in the planning of the railway. One of the aims of Rail Baltica is to improve the image, safety, livability, and accessibility of secondary cities. However, Malk questioned whether the new railway will promote urban integration: “There are fundamental disputes about the feasibility of the project.” It remains to be seen whether Pärnu can benefit from this new infrastructure and “how it can be engineered to not only promote the efficient redistribution of vital resources and people but also become a more *social* infrastructure”, for instance, by building physical infrastructures for various collective purposes, such as changing the function of service roads of railways to double as cycling paths.

ALLEGRA BAUMANN (Darmstadt) explored the interplay between cruise tourism and road infrastructure in Dubrovnik. The adverse effects of mass tourism on cities such as Dubrovnik have been discussed extensively in research. Still, the interplay of the *rhythm* of cruise tourism and the *criticality* of the road infrastructure has been largely neglected. Using Lefebvre's concept of rhythm analysis, Baumann identified the misalignment of circulation rhythms of cruise tourists and citizens as a critical problem of the road infrastructure. Cruise passengers disembark at once, which creates a high influx of visitors to the city. This causes functional crises, such as traffic jams or crowding. The city government has implemented synchronizing measures for mitigating these functional crises, e.g., traffic directive signs. However, because these measures do not consider citizens' daily practices, public discontent against cruise tourism in Dubrovnik subsists.

Panel 3: Materialities of circulation

MORITZ KASPER (Dortmund) presented domestic water storage in Nairobi as a critical intermediary infrastructure centered around social practices and material artifacts dedicated to water provision. Due to the limited capacity of the pipe network, virtually every household needs supplementary sources. The techniques applied include the use of different types of containers, typically portable

jerry cans, super drums as temporary backup, and water tanks for rain collection as well as the organization of their acquisition, sanitation, and transport. Their distribution throughout society reveals “multi-layered inequalities and contestations”, e.g., only wealthier households own water tanks that allow for a more continuous supply. In conclusion, contrary to prevalent notions of fragmentation in the urban South, storing reveals ambiguous reworkings of relations through *stabilization* of supply and inequalities, *disruption* through individualized supply, and *creation* of socio-material networks.

JAKOB WEBER (Basel) explored socio-natural arrangements of land use along the river Wiese at the fringes of minor Basel in the 15th century when the canal network distributing and regulating the water flow was expanded. The uses, carefully visualized with GIS, included meadow irrigation, powering mills, river engineering with sylviculture for construction wood, and fishing. These intensifying activities, resulting conflicts, floodplain dynamics, and ecological rhythms required industrial and territorial actors to settle disputes via a plurality of courts. Based on their documentation, Weber revealed the ambiguity and subtlety of relations at the *socio-natural site*: Ecological conditions proved critical for river use but were mitigated by court sentences; ecological awareness appears in reassessments of water rights between economic maximization and overuse; ecological processes were altered artificially but reciprocally caused adaptations in land use and the court system.

YAFFA TRUELOVE (Boulder) presented some findings of her research on water provision for lower to middle-class households in New Delhi. Since over 40% of the population has no entitlement to piped water, fetching it from distant taps or delivery trucks is an indispensable task traditionally performed by women. Through this labor, their bodies are physically internalized by the technical network and thus act as a complementing *prosthesis of infrastructure*. Used as a “heuristic device”, this view discloses gendered and caste inequalities, as Truelove’s three contentions suggest: First, social power relations require female bodies to act as a prosthesis. Second, securing the highly volatile provision of water every day is a form of infrastructure maintenance and care that keeps lower-class women from paid jobs. Third, the invisibility and disposability of women’s bodies within the infrastructure result in the devaluation of their labor.

Keynote 2: Environment, metabolism, and infrastructures – circulations in Paris, 18th-21st centuries

In her keynote at the end of the conference, SABINE BARLES (Paris) treated *socio-metabolic transitions* in Paris since the 19th century. She identified time-specific patterns by quantifying urban energy consumption and material exchange between the city and its hinterland. Industrialization provoked wood and food shortage and excess mortality. Led by new ideas of circularity, this double crisis was met by introducing infrastructures that helped close metabolic loops, most notably nitrogen. E.g., night soil was systematically directed via the extended sewer network to the urban outskirts, where it was processed into fertilizer for agrarian production to feed urbanites. This industrial *hybrid metabolism* sustained the transition to a new metabolic regime in the 20th century when innovation and globalization fostered the substitution of domestic resources and energy consumption took off with petroleum. This *linearization*, i.e., a reopening of material loops marked by ecological depletion and accumulation accompanied by “growing infrastructural imprints”, significantly contributed to the current environmental crisis. By presenting the current socio-metabolic state in its historical trajectory, Barles critically concluded that ideas of *circular economy* enacted in policies are “illusory” because they yield no quantitative effect on the flows they ostensibly address.

Conclusion

For this report, we summarize the most important insights and evaluate the conference regarding its own ambitions. The conference set out to explore the workings and effects of infrastructural circulations.

The panel on work highlighted the crucial role of workers in facilitating circulation. For example, workers create(d) circulation by processing, moving, and delivering goods in fulfillment centers, fast grocery delivery platforms, or across the Iron Curtain. Simultaneously, circulation also enables work and shapes the daily lives of workers, as in the case of the commuting of migrant workers. The panel scrutinized the prevalent lack of control of these workers over their own time, movement, and work conditions while being (digitally) controlled by companies or farmers, and thereby highlighted aspects of work that are often concealed. Nevertheless, in some instances, workers have used disruption of circulation as a tactical means in their struggle for better working conditions.

The panel on planning revealed how circulation serves as an idealizing narrative to create expectations for new infrastructures, such as the Joá Bridge or the Rail Baltica. Simultaneously, circulation problems also arise in existing infrastructures, such as the urban grid of the tourist destination Dubrovnik, and might be mitigated by the synchronization of traffic rhythms. These findings suggest that economic and political negotiating power often determines circulations.

The panel on materialities was dedicated to socio-physical dimensions of water circulation in contexts where ubiquitous infrastructure provision is not prevalent and users need to organize operation and maintenance for service delivery. Their success varies depending on both the users' social status and the physical boundaries of the ecological environment as in medieval Basel, or the infrastructural capabilities of artifacts and/or human bodies as in Nairobi and New Delhi today.

Despite the *big interdisciplinarity* of the Research Training Group KRITIS, there were no contributions from engineering at the conference, which might have limited the discussion about technical solutions. Nevertheless, the presented empirical research and conceptual approaches proved powerful in analyzing the nature of circulations, brought about by flows of capital and human labor and embedded in social relations of classes, genders, or world regions. Some small-scale remedies were also presented, while more global and fundamental transformations and transitions were only advocated but remain urgent points for further specific discussions.

Contributions

Mathias Denecke *Work it – Circulations in the logistics city*

Nicolás Palacios Crisótopo *“We organize in under 10 minutes” – digital vignettes on spatial abstraction and tactics of resistance in delivery work*

Krischan Bockhorst *How the disruption of a circulation flow enabled new flows across the Iron Curtain*

Carolien Lubberhuizen *Follow the commutes – Commuting trajectories of migrant workers as lens to understand arrival infrastructures and urban-rural circulations*

Rodrigo Cerqueira Agueda *Beyond the Joá – Infrastructural circulations building the future in Rio de Janeiro*

Mattias Malk *When the first train departs – Infrastructural renewal and structures of expectations in secondary cities*

Allegra Celine Baumann *Cruise tourism and circulation – Rhythms of cruise passengers in the city*

Jakob Weber *Socio-natural arrangements with water in the rural-urban fringe of the minor city of Basel during the 15th century*

Moritz Kasper *Jerry cans, super drums, water tanks – Domestic water storage as critical infrastructure in Nairobi*

Yaffa Truelove *The prosthetics of infrastructure – Invisible bodies, devalued labor and the everyday circulation of water in Delhi*